

Claims 1-4, 10-12, and 16-17 were rejected under 35 U.S.C. § 102(b) as being anticipated by Hiroki (U.S. Patent No. 5,306,380), hereinafter referred to as Hiroki '380. Claims 1-3, 10-12, and 16-19 were rejected under 35 U.S.C. § 102(e) as being anticipated by Hiroki (U.S. Patent No. 6,331,095) hereinafter referred to as Hiroki '095. Claims 16 and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Okutani (U.S. Pat. No. 5,135,608) in view of Toba et al. Claims 5-6 and 8-9 were objected to as being dependent from a rejected base claim, but would be allowable if rewritten in independent form to include all of the limitations of the base and any intervening claims.

Firstly, Applicant acknowledges with appreciation the indication of allowable subject matter in Claims 5-6 and 8-9. Accordingly, submitted herewith are new independent Claims 21-24 which include respectively the allowable subject matter of Claims 5, 6, 8, and 9 and the features of the base Claim 1 and the intervening Claims 2, 3, and 7, as necessary. Thus, it is respectfully submitted Claims 21-24 are in a condition for allowance.

Secondly, Applicant submits, as stated above, that the present application and Hiroki (U.S. Patent No. 6,331,095) were commonly owned at the time of the present invention. As such, it is respectfully submitted that the Hiroki '095 reference is not an appropriate reference under 35 U.S.C. § 102(e)/ 103(c).

Thirdly, Claims 1, 12, and 16 have been amended to clarify the claimed inventions.

With regard to Claims 1 and 16, the recited support member has been clarified to define that the support member is linearly reciprocable relative to a distal end arm. As described in the specification, such a feature permits a length of the distal end arm and the support member to be extended and contracted.<sup>2</sup> The outstanding Office Action asserts that

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<sup>2</sup>Specification, page 18, line 11, to page 20, line 2.

Toba et al disclose a distal arm (12) which reciprocates in a first direction when the articulated arm stretches and retracts, and asserts that Toba et al disclose a support member (14) arranged on the distal arm to support a target substrate.<sup>3</sup> Specifically, Toba et al disclose a transfer robot at the distal end of which a hand 14 is only *pivotally* connected to a second arm 12, as shown in Figure 1. Hence, the relationship between the hand 14 and second arm 12 in Toba et al differs from the linearly reciprocatable relationship between the support member and distal end arm defined in amended Claims 1 and 16.

The outstanding Office Action asserts that Hiroki '380 discloses a distal arm (7b) which reciprocates in a first direction when the articulated arm stretches and retracts, and asserts that Hiroki '380 discloses a support member (7c) arranged on the distal arm to support a target substrate (S).<sup>4</sup> Specifically, Hiroki '380 discloses a transfer robot at a distal end of which a third arm element 7c is only *pivotally* connected to a second arm element 7b. Hence, the relationship between the third arm element 7c and second arm element 7b differs from the linearly reciprocatable relationship between the support member and distal end arm defined in amended Claims 1 and 16.

Furthermore, the deficiencies in the teachings of Hiroki '380 and Toba et al are not remedied by the teachings of Okutani. Applicant submits that Okutani only discloses a general structure of a semiconductor processing system, with no disclosure of an articulated arm.<sup>5</sup>

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<sup>3</sup>Office Action, page 3, lines 8-12.

<sup>4</sup>Id., page 3, lines 22-26.

<sup>5</sup>The outstanding Office Action acknowledges on page 6 that Okutani fails to disclose an articulated arm.

Thus, it is respectfully submitted that, with no teaching or suggestion in the applied prior art for a support member linearly reciprocable relative to a distal end arm, independent Claims 1 and 16 and the claims dependent therefrom patentably define over the applied prior art.

With regard to Claim 12, the recited pair of temporary shelves have been clarified to define that temporary shelves of the defined transfer apparatus are arranged *not to rotate together* with an articulated arm unit. As disclosed in the specification, having temporary shelves not arranged to rotate together with an articulated arm unit, such as defined in Claim 21, permit the volume of a vacuum transfer chamber to be smaller than would be necessary if the temporary shelves were arranged to rotate together the articulated arm unit.<sup>6</sup> Meanwhile, Hiroki '380 disclose in Figure 2 a storing member 8 that swings (i.e. rotates) together with an arm 7. Consequently, supporting frames 144, 146, and 148 (i.e., temporary shelves) constituting the storing member 8 in Hiroki '380 rotate with the arm 7. Thus, Hiroki '380 does not disclose or suggest the feature of temporary shelves arranged not to rotate together with an articulated arm, as defined in Claim 21.

Hence, with no disclosure or suggestion for temporary shelves arranged not to rotate together with an articulated arm unit as defined in Claim 21 or for the attendant features thereof, it is respectfully submitted that independent Claim 12 and the claims dependent therefrom patentably define over Hiroki '380.

Hence, the present amendment is believed to overcome the issues raised in the Office Action.

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<sup>6</sup>Specification, page 22, line 10, to page 23, line 12.

Consequently, in view of the present amendment and in light of the broad discussions, the outstanding grounds for rejection are believed to have been overcome. The application as amended herewith is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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IN THE CLAIMS

Please amend Claims 1-17, as follows:

1. (Amended) A transfer apparatus for a semiconductor process, comprising:

an articulated arm unit attached to a support base to be stretchable/retractable within a horizontal plane, the articulated arm unit having a distal end arm which reciprocates in a first direction when the articulated arm unit stretches and retracts;

a support member arranged on the distal end arm to support a target substrate, the support member being attached to the distal end arm to be linearly reciprocatable relative to the distal end arm in the first direction;

a main driving mechanism configured to stretch/retract the articulated arm unit; and

a sub-driving mechanism configured to reciprocate the support member relative to the distal end arm.

12. (Amended) A transfer apparatus for a semiconductor process, comprising:

an articulated arm unit attached to a support base to be stretchable/retractable within a horizontal plane, the articulated arm unit having a distal end arm which reciprocates in a first direction when the articulated arm unit stretches and retracts, the articulated arm unit being rotatable within a horizontal plane relative to the support base;

a support member arranged on the distal end arm to support a target substrate;

a pair of temporary shelves configured to support the target substrate, and disposed to sandwich the support member when the articulated arm unit retracts, the temporary shelves being arranged not to rotate together with the articulated arm unit;

a main driving mechanism configured to stretch/retract the articulated arm unit;  
a rotational driving mechanism configured to rotate the articulated arm unit; and  
a vertical driving mechanism configured to vertically drive the support member and the temporary shelves relative to each other in order to transfer the target substrate therebetween.

16. (Amended) A semiconductor processing system comprising:

an airtight process chamber;

a worktable with a mount surface to support a target substrate disposed in the process chamber;

a supply system configured to supply a process gas into the process chamber;

an exhaust system configured to evacuate an interior of the process chamber by vacuum;

an airtight transfer chamber connected to the process chamber through a gate; and

a transfer apparatus disposed in the transfer chamber to load/unload the target substrate into/from the process chamber, the transfer apparatus comprising,

an articulated arm unit attached to a support base to be stretchable/retractable within a horizontal plane, the articulated arm unit having a distal end arm which reciprocates in a first direction when the articulated arm unit stretches and retracts[;],

a support member arranged on the distal end arm to support the target substrate, the support member being attached to the distal end arm to be linearly reciprocatable relative to the distal end arm in the first direction[;],

a main driving mechanism configured to stretch/retract the articulated arm unit[;], and  
a sub-driving mechanism configured to reciprocate the support member relative to the  
distal end arm.

Claims 21-24 (New).